What percentage of potato chip bags that weigh less than advertised amount would you accept as a consumer?

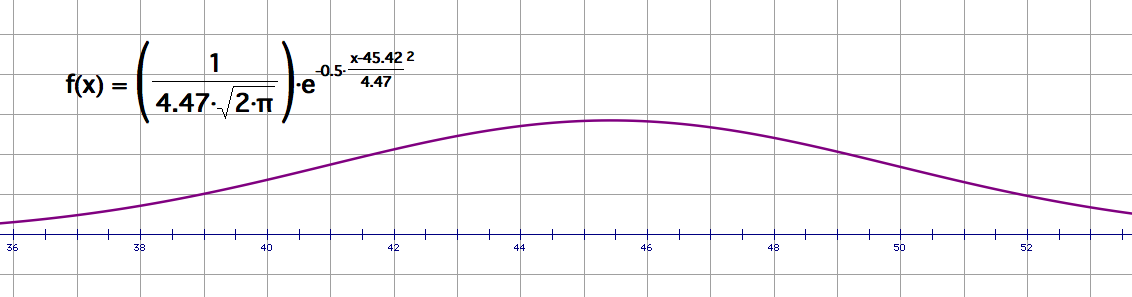
a) 0 – 2%? b) 2 – 10%? c) 10 – 20%? d) 20 – 50%?

Potato Chip Data



California Earthquake Chips - Advertised 42 g Net Weight

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **34** | **42** | **45** | **46** | **48** | **48** |
| **36** | **42** | **45** | **46** | **48** | **49** |
| **36** | **43** | **45** | **46** | **48** | **50** |
| **36** | **43** | **45** | **46** | **48** | **50** |
| **37** | **43** | **45** | **46** | **48** | **50** |
| **39** | **43** | **45** | **46** | **48** | **50** |
| **39** | **44** | **46** | **46** | **48** | **50** |
| **41** | **45** | **46** | **47** | **48** | **53** |
| **41** | **45** | **46** | **47** | **48** | **54** |
| **41** | **45** | **46** | **47** | **48** | **59** |

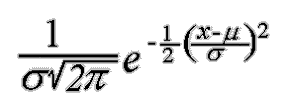


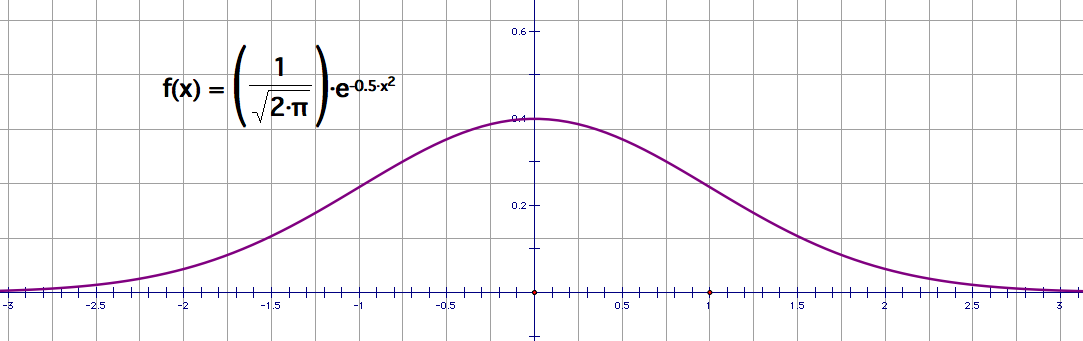
**The Normal Distribution**

The normal distributions are a very important *class* of statistical distributions. All normal distributions are symmetric and have bell-shaped density curves with a single peak.

To speak specifically of any normal distribution, two quantities have to be specified: the mean μ (population mean – we will use , the sample mean), where the peak of the density occurs, and the standard deviation σ (population standard deviation - we will use *s*, the sample standard deviation), which indicates the spread or girth of the bell curve.

The normal density can be actually specified by means of an equation. The height of the density at any value *x* is given by

Although there are many normal curves, they all share an important property that allows us to treat them in a uniform fashion.



**The 68-95-99.7% Rule**

  All normal density curves satisfy the following property which is often referred to as the *Empirical Rule*.

**68%**

of the observations fall within **1 standard deviation** of the **mean**, that is, between ±1 *s*.

**95%**

of the observations fall within **2 standard deviations** of the **mean**, that is, between ±2 *s*.

**99.7%**

of the observations fall within **3 standard deviations** of the **mean**, that is, between ±3 *s*.

Thus, for a normal distribution, almost all values lie within **3 standard deviations** of the mean.

Z-Score: 

Normal Table (see separate file for complete table):

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **z** | **0** | **0.01** | **0.02** | **0.03** | **0.04** |
| **0** | 0.5 | 0.504 | 0.508 | 0.512 | 0.516 |
| **0.1** | 0.5398 | 0.5438 | 0.5478 | 0.5517 | 0.5557 |
| **0.2** | 0.5793 | 0.5832 | 0.5871 | 0.591 | 0.5948 |
| **0.3** | 0.6179 | 0.6217 | 0.6255 | 0.6293 | 0.6331 |
| **0.4** | 0.6554 | 0.6591 | 0.6628 | 0.6664 | 0.67 |
| **0.5** | 0.6915 | 0.695 | 0.6985 | 0.7019 | 0.7054 |
| **0.6** | 0.7257 | 0.7291 | 0.7324 | 0.7357 | 0.7389 |
| **0.7** | 0.758 | 0.7611 | 0.7642 | 0.7673 | 0.7704 |
| **0.8** | 0.7881 | 0.791 | 0.7939 | 0.7967 | 0.7995 |
| **0.9** | 0.8159 | 0.8186 | 0.8212 | 0.8238 | 0.8264 |
| **1** | 0.8413 | 0.8438 | 0.8461 | 0.8485 | 0.8508 |